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SITE: Advanced Labs Chemical

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SPRINGFIELD CHLORINE FIRE SITE

SPRINGFIELD, MASSACHUSETTS

Prepared for:

**U.S. Environmental Protection Agency
Region I
60 Westview Street
Lexington, Massachusetts**

CONTRACT NO. 68-01-7367

TAT-01-N-00260

TDD NO. 01-8806-10A

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Region I**

August 1988

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1.0 SITE BACKGROUND

On Friday, June 17, at 10:00 hours, a two alarm fire broke out at the Advanced Laboratories, Inc. facility at 1 Allen Street, Springfield, Massachusetts. The fire was caused by the reaction of chlorine with water after rain entered an open window. Springfield Firefighters responded and contained the reaction while the Springfield Police blocked traffic coming into the area. Several firemen received minor injuries and had to be hospitalized.

The old brick and stone mill facility, Circa 1902, which was used until 1968 to house machinery for manufacturing rifle barrels, had been utilized as a pool chemical packaging/storage operation, for the last fifteen years. Known as the Old Watershops Armory Building, the site had been used for armament production since the Revolutionary War when a gunpowder factory existed there. During the Civil War it served as an adjunct facility to the Springfield Armory on State Street. The 35' high dam underneath it, which occurs naturally due to geologic conditions, empties a large pond behind it called Watershop Pond.

In 1976, the mill was sold to Henry Deleo and Carlo Rovelli by the Springfield Community Savings Bank. Advanced Laboratories, Inc. is listed by the Massachusetts Secretary of State as being owned by John P. Pereira of E. Greenwich, RI and Robert M. Petrin of Coventry, RI.

The building was able to operate under Industrial A zoning because of a grandfather clause in the zoning regulations. Under normal circumstances the business would not have been allowed to operate in this thickly-settled residential district with the types and amounts of chemicals it was working with. The business was being watched closely by the Massachusetts Department of Environmental Quality Engineering because of it's past record of non-compliance to regulations and sloppy housekeeping. Between 9/84 and 3/87 it had failed to provide a list of chemicals stored on the property. On two occasions dumpster fires occurred because of chemicals put there. An employee alleged that the company dumped chemicals into Watershops Pond but this was not proven. According to the Occupational Health and Safety Administrator there were continuing violations due to inadequate protection for workers who were tabletize chlorine powders.

Close to midnight on the day of the fire a second fire broke out due to the reaction of chlorine with water. When these two are mixed, an oxidation reaction occurs which both gives off toxic chlorine fumes and (since it is an exothermic reaction) sets afire flammable materials in the vicinity. The result over the next half day was a major fire and the formation of a green-yellow plume of chlorine smoke that measured 2 miles by 4 blocks in extent.

At the core of the fire was a second floor room with 600-800 barrels of chlorine, each containing 300 pounds at 85% purity. Sprinklers that were installed prior to the building's present use started operating but served only to increase the number of reactions.

DEQE Commissioner Daniel J. Greenbaum declared an air pollution state of emergency which allowed city officials to subsequently order the evacuation of 20,000-30,000 people within a two mile radius of the plant. Several city shelters were opened around Springfield to house the evacuees. Flames burned out of control for many hours especially in the north end of the building where they shot 100 feet into the air. 52 tons of neutralizing chemicals (boric acid, sodium sulfate) were ordered to assist in getting the reactions under control. They were to be applied to the fire by Clean Harbors, Inc. Instead of using the chemicals however, it was decided at about 18:00 hours to pour copious amounts of water onto the building in order to cool it down and disburse the chlorine cloud.

A total of about 250 people including firefighters were treated and released from area hospitals suffering mostly from skin rashes, irritated eyes and noses, and respiratory problems. One hundred and fifty people had to be evacuated from Ring Nursing Home at 155 Mill Street. These and others were transported by a private bus company volunteering help.

Finally the fire had died down considerably by Saturday night, June 18. "Hot spots" inside which appeared wet, bubbly and giving off intense heat, were treated with the boric acid/sodium sulfate powder mixture. Firemen inside threw some chlorine barrels out large holes where the windows once were.

Thousands of pounds of water per minute washed off the building grounds and into the Mill River which fed into the Connecticut River, but the pollution potential was minimized and a pH check revealed a normal reading. Most of the chlorine had in fact been disbursed into the air.

Several businesses in the mill suffered considerable damage as did vegetation near the site. Up to 1,000 residents of the surrounding neighborhoods will be filing a class action suit to recoup losses incurred to pets, autos, houses, and gardens. The City of Springfield Law Department was expecting to "aggressively pursue" reimbursement of the city's costs which amounted to between \$500,000 and several million dollars.

2.0. CHRONOLOGICAL SUMMARY

Saturday, June 18, 1988

The U.S. Environmental Protection Agency (U.S. EPA) arrived at Advanced Labs on Allen Street to assist the Massachusetts

Wednesday, June 22, 1988

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TAT members George Mavris and Stephen Allen arrived on site and offered technical assistance to Craig Givens, Site Coordinator for the DEQE - Western Region.

Personnel from the Springfield Fire and Police Departments, DEQE, Clean Harbors, Inc. (CHI), Occupational Safety and Health Administration (OSHA), Red Cross, and the local newspaper and television stations were on site.

Craig Givens requested EPA assistance in obtaining the names and addresses of the current owners and leases of the facility involved in the fire. G. Mavris contacted Lee McMichael (EPA) and informed her of this request.

A structural engineer from Clean Harbors, Inc. examined the structural integrity of the facility in the area where the damaged containers were being moved and loaded into a tractor trailer truck. This area was determined to be structurally sound and the removal operations continued.

The TAT members monitored site activities as the removal continued. An air monitoring survey was conducted around the perimeter of the facility using chlorine Drager tubes and a chlorine Monitox unit. No chlorine was detected by these instruments.

The Clean Harbors, Inc. crew continued to remove the damaged containers from the first floor of the facility while using Level C personnel protective equipment. The containers were loaded into a tractor trailer and a roll-off truck. The trucks were then escorted by local police and fire department vehicles to the Bondi's Island Landfill in Springfield, MA for disposal.

One of the Clean Harbors workers was overcome by heat stress. He was taken to a local hospital, treated, and later released.

Thursday, June 23, 1988

TAT members George Mavris and Stephen Allen arrived on site to monitor the remedial effort.

Clean Harbors, Inc, personnel were removing product from the first floor and neutralizing small chlorine reactions on the second floor (south end) caused by rain and/or moisture in the air. Removed materials were being transported to the City of Springfield wastewater treatment plant (Bondi's Island) for use there.

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The TAT members recorded short duration Monitox levels of up to 2.0 ppm. Two Clean Harbors, Inc. workers in level "B" PPE suffered signs of heat stress. TAT members noticed more effort would be required to prevent rain from creating additional reactions, but they didn't have any firm recommendations.

Friday, June 24, 1988

TAT members Tim Jones and Stephen Allen reported to the site to monitor the removal.

Clean Harbors, Inc. personnel continued removing product and stabilizing reactions with neutralizing powders ("Magic Dust"). The pumping of dry chemicals produced a white dust cloud in the vicinity of the building but this dispersed rapidly and represented no threat to nearby citizens.

The TAT, in level "B" PPE, escorted OSC David Ferenz, an O.H. Materials site manager, and a contracted structural engineer (John W. Mevins of Simpson, Gumpertz and Hege, Inc., Arlington, MA) with an HNU photoionization detector and a Monitox Cl₂ detector to insure the safety of these inspectors during their structure investigation of the building. The structural engineering report can be found as an appendix to this report (See Appendix F).

A sketch of the Mill layout with areal dimensions is included as Figure 3.

Monday, June 27, 1988

TAT members Tim Jones and Stephen Allen traveled to the site to report on the removal progress to date.

A large container had reacted on Saturday, June 25 but was neutralized quickly by Clean Harbors, Inc. They continued stabilization efforts today by manually mixing remaining product with neutralizers. Product transfer to the Springfield wastewater treatment plant continued.

Fire inspectors from the arson squad were on site conducting an inspection. The DEQE representative stated that there were tannery products in the basement from a prior business enterprise.

Tuesday, June 28, 1988

TAT members Stephen Allen and Dennis Giustra reported to the site.

Clean Harbors, Inc. had only two workers at the site who were watching for possible Cl₂ reactions. The mixing of products and neutralizer has to this point been effective in preventing further reactions.